

REMARKS

Claim 1 has been slightly amended to be made consistent with the description. The surface of the stator seal must have a diameter "slightly greater" than the outer tip diameter of the teeth to provide the "very small clearance" described at page 2, paragraph [0009] ("There is a very small clearance between the tip of teeth 13 and the inner surface of the stator seal.") The limitations of claim 4 have been added to claim 1. Claim 4 has been cancelled.

The Examiner has rejected claim 1 under 35 U.S.C. § 103(a) as being unpatentable over Miller U.S. Patent No. 4,420,161 in view of Burnett et al. U.S. Patent No. 6,679,681. The Examiner states:

Miller discloses an apparatus having a labyrinth seal having a seal section (section having 43-46) on a stator and swirl vanes (e.g. 37 shown below) on the stator, a shaft (e.g. 10) comprising a first toothed section and a second toothed section, a cylindrical surface (surface between 32 and 50, 32 is part of the second toothed section and 50 is part of the first toothed section) of a diameter less than the outer edge of the teeth of the toothed sections and the seal section having teeth (43-46).

Miller discloses the invention as claimed above but fails to disclose that the apparatus having an abradable labyrinth seal having an abradable coating on the stator. Burnett discloses a labyrinth seal (figure 9) having toothed sections (e.g. toothed section having 652 and toothed section having 644) on two members that are relatively rotating (figures 9) and at the same time in another embodiment provides a labyrinth seal (figure 8) having toothed section (section having 548) on a member (e.g. 510) and an abradable seal having an abradable coating (e.g. 550) on another member (e.g. 526). It would have been obvious to one having ordinary skill in the art at the time of the invention to have the seal section of Miller to have an abradable coating instead of teeth as taught by Burnett, to provide seal with reduce solid particle erosion (column 4, lines 52-53 of Burnett) and having toothed section or an abradable is art equivalent.

Reconsideration is respectfully requested.

The raised lands 50, 52 of Miller are not teeth and there is no smooth cylindrical abradable coating on the surface of the stator radially outward of the raised lands. To modify Miller to come within Applicants' claims would require moving "teeth" 43-46

from the floating "H-rings" to the shaft and then to place an abradable surface inside the stator. Burnett et al. does not suggest such rearrangement. Burnett et al. teaches a labyrinth tooth 548 on the shroud 514 around the bucket 510. If anything, Burnett et al. would suggest placing the teeth 24-26 of Miller on the end of blade 38 of Miller.

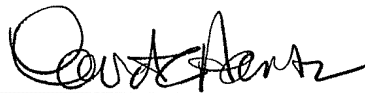
The Examiner has rejected claims 4-6, now 1, 5, 6, under § 103 further in view of Jude U.S. Patent No. 881,474. The Examiner cites page 1, lines 89-94 of Jude to use V-shaped vanes "and as oriented as shaft rotation, to provide more efficient sealing apparatus with low loss of working fluid." The vanes being referred to in this passage are the "secondary guide blades a'," the blades, however, are designed to create swirl in the direction of rotation of the shaft. This, of course, is the very opposite of the purpose (and, therefore, the orientation) of the "swirl-reversing vanes" set forth in Applicants' claims. Following the teachings of Jude, as explained by the Examiner, would not result in the purported modification of Miller and Burnett et al. to come within the Applicants' claims.

The Examiner is picking and choosing from three references and reassembling parts of each to meet the Applicants' claimed structure.

In view of the foregoing amendments and remarks, it is urged this case is now in condition for allowance.

Respectfully submitted,
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